IN THE CLAIMS

Claim 1 (cancelled)

Claim 2 (previously presented): The method according to Claim 7 wherein said train of pulses comprises only two or three pulses.

Claim 3 (previously presented): The method according to Claim 7 wherein said wire is selected from a group consisting of gold, copper, silver, alloys thereof, plated materials, and insulated metal wires.

Claim 4 (previously presented): The method according to Claim 7 wherein said wire is selected from a group consisting of wire diameters in the range from about 15 to 75 μm for gold and about 25 to 75 μm for copper.

Claim 5 (previously presented): The method according to Claim 7 wherein said wire melting and ball forming is performed in ambient air.

Claim 6 (previously presented): The method according to Claim 7 wherein said train of EFO current pulses is further controlled to reduce size and damage in the heat-affected zone, thereby providing smooth wire loop formation.

Claim 7 (previously presented): A method for forming a substantially spherical free air ball on a fine non-oxidizable wire in a computerized bonder having an electronic flame-off (EFO) apparatus operable to generate pulses of different heights and widths, comprising the steps of:

positioning a free end of said wire opposite to an EFO electrode, spaced apart by a gap;

applying a train of EFO current pulses between said electrode and said wire;

controlling said pulse heights to melt a pre-determined volume of said wire controlling said pulse widths to create a substantially spherical ball shape; and

automatically calculating the train of consecutive EFO current pulses of various heights and widths to produce a desired ball characteristic in a predetermined amount of time,

wherein said train of EFO current pulses provides a continuous series of pulses of progressively lower heights, yet various pulse widths.

Claim 8 (original): The method according to Claim 7 wherein said pulse train of progressively lower heights minimizes the heat affected zone of the wire.

Claim 9 (previously presented): The method according to Claim 7 wherein said train of EFO current pulses provides a series of pulses alternating between high and low heights and various widths.

Claim 10 (original): The method according to Claim 9 wherein said low pulse height is configured to prevent overheating of the free air ball and wire necking while maintaining the EFO arc.

Claim 11 (previously presented): The method according to Claim 7 wherein said automatic pulse train calculation is provided by pre-determined empirical data stored in said computerized bonder.

Claim 12 (cancelled)

Claim 13 (currently amended): A method of forming a ball at the end of a wire, comprising the step of:

exposing an end of the wire to a plurality of current pulses, wherein each pulse in said plurality of said current pulses has a lower magnitude than a preceding pulse,

wherein the plurality of current pulses comprises three pulses, wherein the first of the three pulses is of a first duration, the second of the three pulses is of a second duration, the second duration being shorter than the first duration, and the third of the

three pulses is of a third duration, the third duration being longer than the first and second durations, and

wherein said first, second, and third pulses are successively applied to form said ball.

Claim 14 (currently amended): The method of Claim 13 wherein a last pulse in said plurality is of a magnitude that is about half the magnitude of the first pulse in said plurality of current pulses.

Claim 15 (currently amended): The method of Claim 13 wherein the duration of the ~~last~~ third pulse in said plurality is over twice as long as the duration of the first pulse in said plurality of current pulses.

Claim 16 (cancelled)

Claim 17 (currently amended): A method of forming a ball at the end of a wire, comprising the steps of:

exposing the end of the wire to a first current pulse;

exposing the end of the wire to a second current pulse, wherein the second pulse is of lesser magnitude than the first pulse; and

exposing the end of the wire to a third current pulse to form said ball, wherein the third pulse is of a magnitude between the magnitudes of the first and second pulses,

wherein the first of the three pulses is of a first duration, the second of the three pulses is of a second duration, the second duration being shorter than the first duration, and the third of the three pulses is of a third duration, the third duration being longer than the first and second durations.

Claim 18 (previously presented): The method of Claim 17 wherein the third current pulse is of a magnitude that is about half the magnitude of the first current pulse.

Claim 19 (previously presented): The method of Claim 17 wherein the duration of the third current pulse is over twice as long as the duration of the first current pulse.